



# What Not to Do... In Energy Auditing

**Energy management professionals usually define themselves as 'wearing many hats', which makes the profession interesting and dynamic but also requires an all-round knowledge and experience in key subjects. Whilst there is a plethora of information available out there in each topic, there are only so many hours in the day that can be devoted to reading and research.**

The EMA is looking at key areas of energy management and asking those who focus on those areas at their organisations for their views and tips. Throughout this year, we tackled what not to do in energy procurement, waste management, energy management strategy and behaviour change and motivation. In this issue, we turn our attention to energy auditing.

**Nasrin Khanom, Environment and Sustainability Manager at University of West London**

**When gathering and analysing pre-audit data, you should never ever assume that the data is accurate.**

Have a closer look at the data to identify any gaps and if any has been estimated. It is helpful to gather the source of data so you can analyse it in advance and prepare questions to ask on the day of the audit.



**When selecting the most appropriate auditing technique, you should never ever do the audit without following any official guidance on how to do an energy audit.**

There is much well-known guidance such as ISO 50002, BS EN 16247 and EMA's Energy Auditing Guide that provides a useful structure to follow when conducting the audit and presenting the findings in a report.

**When auditing a building's lighting, you should never ever forget to take a measurement of the lux level.**

If you are recommending changing the existing lights to LEDs, then consider the impact the new fitting will have on the occupiers of that space as LEDs are generally brighter. Try to avoid recommending for a like-for-like replacement, and instead consider installing the LEDs based on a full lux level design for each space.

**When auditing a building's heating systems, you should never ever neglect the potential savings from insulating the heating system, tank and pipework.**

Insulation reduces heat losses and increases efficiency of the heating system. A good insulation could even generate an energy saving of up to 30%.

**When auditing a building's cooling systems, you should never ever review the cooling systems setup without taking into account the outside air temperature.**

In general, the climate of the UK is often cool and therefore there will be days when the cooling system does not need to be in operation.

**When auditing a building's pumping systems, you should never ever ignore the potential savings associated with changing the pumps to Variable Speed Drives (VSDs).**

Installing VSDs is the easiest and most efficient way to reduce the pump's power consumption. Reducing the motor speed by 20% could generate an energy saving of up to 50%.

**When auditing a building's ventilation systems, you should never ever assume the fans are in good working condition.**

It is handy to use an air flow meter during the audit as it will give you an idea about the fan speed. If you find the speed is low, then further investigation is needed. Also have a look at the PPM schedules to check when the fans were last cleaned.

**When auditing a building's compressed air generation, you should never ever forget to review records of air leaks to determine if there is a pattern of continuous leaks and physically check the piping system.**

On average, 15-50% of the air production flows through the leaks, and so it is important to repair leaks.

**When auditing a building's control systems, you should never ever assume the HVAC plant configuration on the control system has been set up correctly.**

There may be some plants and data that are not displayed correctly on the system, and some plants that are not controlled by the system. It is a good idea to double check the setup on the control system against other useful information such as schematics, O&M's and energy data as well against the information from a visual inspection of the plant.

**When writing an energy audit report, you should never ever forget who the end user is.**

Try to limit the information you present to what the end user would need to know in order for them to take it to the next stage.

**When including technical information in an audit report, you should never ever write it in a way that is difficult for the end users to grasp.**

Consider your writing style and the terminologies used and try to keep it simple by presenting key information. This is important so that the report could be understood by a large audience and it becomes useful enough to take further action. If you need to add more details, then maybe consider a separate report for a technical user.

**When including financial information in an audit report, you should never ever forget to add any contingency costs such as the cost for follow-up technical design surveys, and VAT.**

The end user needs to understand the full costs so they can make plans to set aside realistic budget to implement the energy saving measures.



**Peter Johan Bergh Lindersen,  
Senior Consultant at DNV GL**



**When gathering and analysing pre-audit data, you should never ever trust the data you received from the customer without asking additional questions to ensure the quality of it.**

You should check if it makes sense based on the size of the site you are auditing and the work that takes place on the site.

**When selecting the most appropriate auditing technique, you should never ever use the same fit-for-all for your audits.**

You should adapt it to the people you will be working with as you would like to collect as much information as possible. People think differently and it is good to be able to adapt to the people you are performing the audit with. You are interested in as much useful input as possible to create a good audit report.

**When auditing a building's lighting, you should never ever trust only what you see in the ceiling when the light is on.**

Try to see if you can see which light bulbs or tubes are being used as there are often some replacement tubes and bulbs in the maintenance room. This should hopefully confirm what you see and can be used as input to your energy balance.

**When auditing a building's heating systems, you should never ever only trust what the maintenance people on site are telling you about the heating system.**

You should try to see it with your own eyes and check how it is set up in the BMS, if they have one.

**When auditing a building's cooling systems, you should never ever only trust what the maintenance people on site are telling you about the cooling system.**

You should try to see it with your own eyes and check how it is set up in the BMS, if they have one.

**When auditing a building's pumping systems, you should never ever only trust what the maintenance people on site are telling you about the pumping system.**

You should try to understand how it is connected to the heating, cooling and the domestic water systems like toilets and sinks. By working out how it is all connected, it should help you to get a good input for your energy balance calculations.

**When auditing a building's ventilation systems, you should never ever only see how it is supplied to the site you are visiting.**

You should always try to see where the air is supplied from and how these machines work as there are large differences in how ventilation can be supplied to a site.

**When auditing a building's compressed air generation, you should never ever only see the compressors.**

Try to see how compressed air is delivered and where there could be potential leaks. The better you understand the system, the better improvement opportunities you can suggest such as reducing the pressure as many systems use a too high pressure that creates wasted energy.

**When auditing a building's control systems, you should never ever only see the system with your own eyes.**

Try to speak to the maintenance people on site on how they use it and if they can show you how the system works. This allows you to understand if they are able to use the system and if they use it correctly. Many sites have a BMS, but only a few of them use it correctly.

**When writing an energy audit report, you should never ever include information you are not using in your report.**

I would recommend including only information that is useful for the reader to understand what has been audited and then include the analysis part such as an analysis of the energy data, an energy balance and the energy saving opportunities. I have seen several reports that include unnecessary information and only confuse the reader of the report. Try to make it accurate and to the point with all the required information.

**When including technical information in an audit report, you should never ever copy and paste directly from a technical document.**

Try to understand if the information you add in your report is useful to understand how the equipment works. Adding equipment dimensions from the fact sheet will most likely not be useful for the energy audit report.

**When including financial information in an audit report, you should never ever say that it includes 100% correct information as this very often changes quickly.**

Estimates for energy saving opportunities are there for the customers to understand what price range we are looking at, but not the exact cost of implementing an opportunity. There will always be variations, and this would not be fully understood before a more detailed study of the selected opportunity takes place.





# EMA SERVICES

PUTTING ENERGY MANAGEMENT AT THE  
HEART OF BRITISH BUSINESS

## NET ZERO

- We can help you to understand and calculate your carbon footprint
- We can help you to create an action plan and put practical measures in place to meet your targets

## SECR COMPLIANCE

- We can help you to prepare your report and meet the compliance requirements
- We can verify your report to assure accuracy, completeness and consistency to ensure compliance

## ENERGY MANAGEMENT

- We can help you to deliver energy management and energy efficiency
- We can identify training needs, deliver tailored training & embed the knowledge within your team